CLAIMS
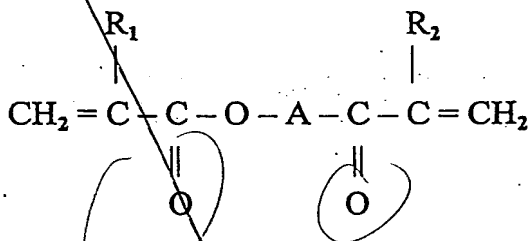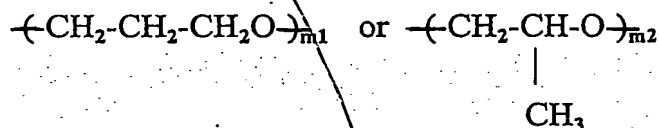
1. A polymerizable monomeric composition comprising :
   - from 35 to 70 parts by weight of one or more monomers (I) of formula :

$$CH_2 = C - C - O - A - C - C = CH_2$$
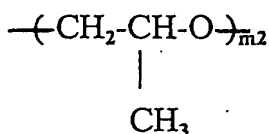
with R_1 above the first C and R_2 above the last C, and O (double-bonded) below each middle C.

wherein

R_1 and R_2 represent H or CH_3,

A is a divalent moiety of formula :

$$-(CH_2\text{-}CH_2\text{-}CH_2O)_{m1} \quad or \quad -(CH_2\text{-}CH\text{-}O)_{m2}$$
$$ |$$
$$ CH_3$$

m1 and m2 each are an integer in the range of 4 to 20,
   - from 5 to 50 parts by weight of a monomer (II) comprising at least a urethane unit and at least two (meth)acrylate functions, and
   - from 5 to 40 parts by weight of a monomer (III) with a high Abbe number and comprising one or more methacrylate functions, the total of the monomers (I), (II) and (III) representing 100 parts by weight.

2. A composition according to claim 1, characterized in that, in the monomer formula (I), said divalent unit A represents :

$$-(CH_2\text{-}CH\text{-}O)_{m2}$$
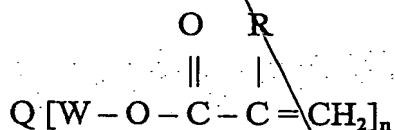$$ |$$
$$ CH_3$$

m2 being as defined in claim 1.

3.   A composition according to claims 1 or 2 characterized in that it comprises from 40 to 60 parts by weight of monomers (I) and m_1 and m_2 are integers from 5 to 10.
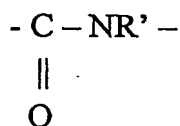
4.   A composition according to any one of the preceding claims, characterized in that the monomer (II) is a urethane di(meth)acrylate oligomer.

5.   A composition according to claim 4, characterized in that said urethane di(meth)acrylate oligomer is an aliphatic polyester.

6.   A composition according to any one of claims 1 to 3, characterized in that the monomer (II) has the following formula :

$$Q \left[W - O - \underset{\underset{O}{\parallel}}{C} - \underset{\underset{}{\overset{R}{|}}}{C} = CH_2 \right]_n$$

wherein Q is a moiety of a valence n, with a straight, branched or cyclic structure, comprising at least two units of formula :

$$- \underset{\underset{O}{\parallel}}{C} - NR' -$$

W is a divalent alkyl moiety, with a straight or branched structure, containing from 1 to 5 carbon atoms,
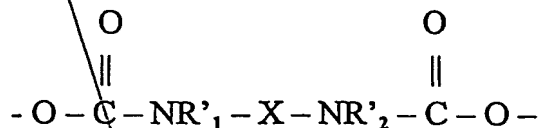n varies from 2 to 4,
R represents H or CH_3, and
R' represents H or a valence link.

7.   A composition according to claim 6, characterized in that W represents the $-CH_2CH_2-$ moiety.
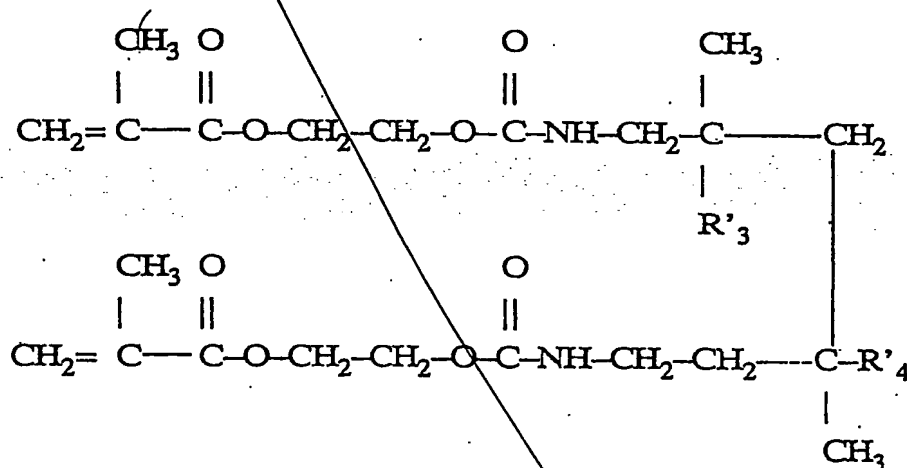
8. A composition according to claim 6 or 7, characterized in that, in the monomer formula (II), the Q moiety is a divalent moiety having the following formula :

$$- O - \overset{\overset{\displaystyle O}{\|}}{C} - NR'_1 - X - NR'_2 - \overset{\overset{\displaystyle O}{\|}}{C} - O -$$

wherein X represents a straight or a branched divalent alkyl chain having from 1 to 5 carbon atoms, preferably from 8 to 12 carbon atoms, and R'_1 and R'_2 independently from one another represent H or CH_3.
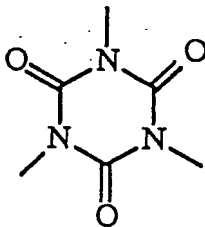
9. A composition according to claim 8, characterized in that the monomer (II) has the following formula :

$$CH_2= \overset{\overset{\displaystyle CH_3}{|}}{C} - \overset{\overset{\displaystyle O}{\|}}{C} - O - CH_2 - CH_2 - O - \overset{\overset{\displaystyle O}{\|}}{C} - NH - CH_2 - \overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle R'_3}{|}}{C}} - CH_2$$

$$CH_2= \overset{\overset{\displaystyle CH_3}{|}}{C} - \overset{\overset{\displaystyle O}{\|}}{C} - O - CH_2 - CH_2 - O - \overset{\overset{\displaystyle O}{\|}}{C} - NH - CH_2 - CH_2 - \overset{\overset{}{}}{\underset{\underset{\displaystyle CH_3}{|}}{C}} - R'_4$$

wherein R'_3 and R'_4 represent, independently from one another, H or CH_3.

10. A composition according to claim 6 or 7, characterized in that, in the monomer formula (II), Q represents a trivalent moiety of formula :
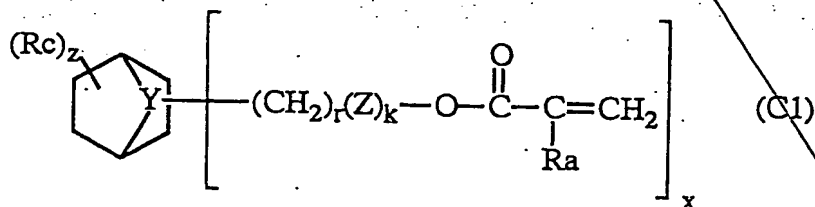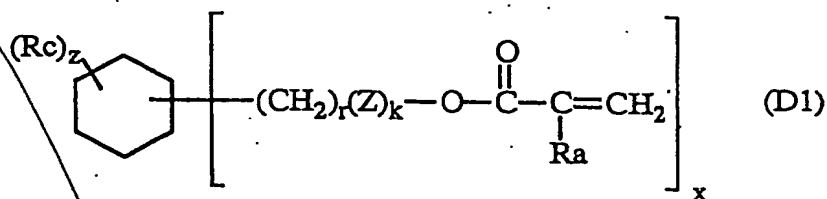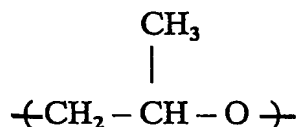
11. A composition according to claim 10, characterized in that the monomer (II) has the following formula :

$$CH_2=C-C-O-CH_2CH_2-N \quad N-CH_2CH_2-O-C-C=CH_2$$

wherein R''_1, R''_2 and R''_3 represent, independently from each another, H or CH_3.

12. A composition according to any one of the preceding claims, characterized in that it comprises 30 to 40 parts by weight of monomer (II).

13. A composition according to any one of the preceding claims, characterized in that the monomer (III) with a high Abbe number comprises at least one non aromatic cyclic or polycyclic hydrocarbon moiety.

14. A composition according to claim 13, characterized in that the monomer (III) is selected amongst at least one of the monomers of the following formulae :

$$\left[CH_2=C-C-O-(Z)_k-(CH_2)_r\right]_x \left[\quad\right]_w \left[-(CH_2)_s-(Z)_l-O-C-C=CH_2\right]_y \quad (A1)$$

$$\left[CH_2=C-C-O-(Z)_k-(CH_2)_r\right]_x \left[\quad\right] \left[-(CH_2)_s-(Z)_l-O-C-C=CH_2\right]_y \quad (B1)$$

$$(Rc)_z \quad Y\left[-(CH_2)_r(Z)_k-O-C-C=CH_2\right]_x \quad (C1)$$

$$
(Rc)_z \underset{}{\text{[cyclohexyl]}} \left[-(CH_2)_r(Z)_k - O - \overset{\overset{O}{\|}}{C} - \underset{Ra}{C} = CH_2 \right]_x \qquad (D1)
$$

wherein :

Y a divalent moiety selected amongst -O-, -CH$_2$-, -C(CH$_3$)$_2$-, -C(H)(CH$_3$)-,

Z is a divalent moiety selected amongst -(CH$_2$)$_p$-O-, p being an integer from 1 to 4 and

$$
\overset{\overset{CH_3}{|}}{-(CH_2 - CH - O)-}
$$

R$_a$, R$_b$ represent H or CH$_3$, R$_c$, R$_d$ represent, independently from one another, a straight or a branched alkyl moiety, having from 1 to 6 carbon atoms,

R$_i$, R$_j$ represent, independently from one another, a straight or a branched alkyl moiety, having from 1 to 10 carbon atoms,
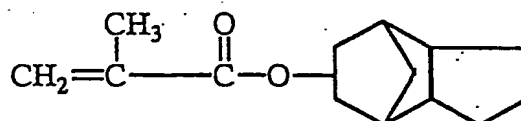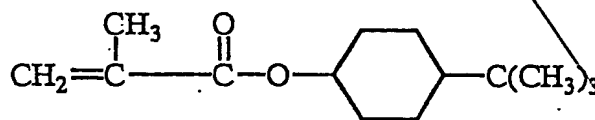
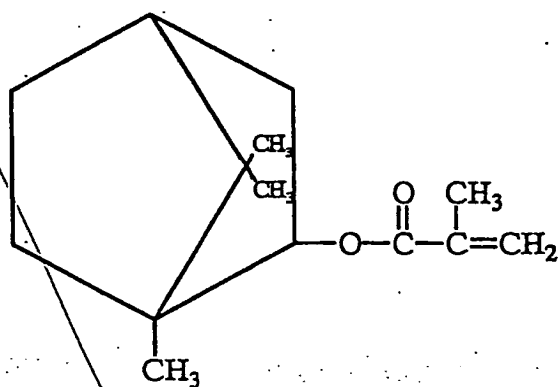w is an integer of 1 to 3, x is an integer of 0 to 3, y is an integer of 0 to 3, providing that x + y is equal to or higher than 1, k is an integer of 0 to 6, l is an integer of 0 to 6, r is an integer of 0 to 6, s is an integer of 0 to 6, z is an integer of 0 to 3 and t is an integer of 0 to 3.
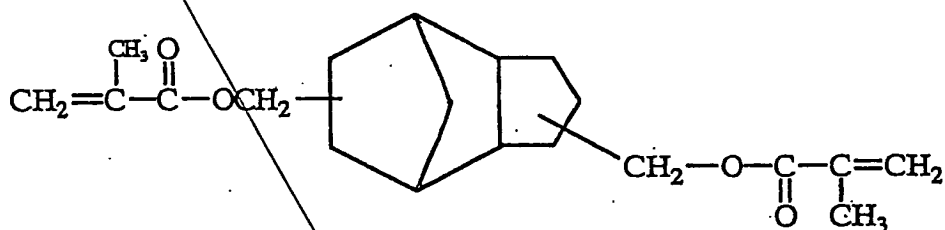
15. A composition according to claim 14, characterized in that the monomer (III) is selected amongst the monomers of formulae :

$$
CH_2 = \overset{\overset{CH_3}{|}}{C} - \overset{\overset{O}{\|}}{C} - O - \underset{}{\text{[cyclohexyl]}} - C(CH_3)_3
$$

$$
CH_2 = \overset{\overset{CH_3}{|}}{C} - \overset{\overset{O}{\|}}{C} - O - \underset{}{\text{[bicyclic structure]}}
$$

$$CH_3$$
$$CH_3$$
$$-O-\overset{O}{\overset{\|}{C}}-\overset{CH_3}{\overset{|}{C}}=CH_2$$
$$CH_3$$

$$CH_2=\overset{CH_3}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-OCH_2-$$
$$CH_2-O-\overset{}{\underset{O}{C}}-\overset{}{\underset{CH_3}{C}}=CH_2$$

16.   A composition according to any one of the preceding claims, characterized in that it comprises from 10 to 30 parts by weight of monomer (III).

17.   A composition according to any one of the preceding claims, characterized in that the monomers (II) and (III) each provide, through homopolymerization, a homopolymer with a refraction index lower than or equal to 1.54.

18.   A composition according to any one of the preceding claims, characterized in that it comprises one or more monomers (IV) polymerizable by radical mechanism and that are different from the monomers (I), (II) and (III), in a proportion of 0 to 40 % by weight based on the total weight of monomers (I), (II) and (III).

19.   A composition according to any one of the preceding claims, characterized in that the monomer (IV) is such that its homopolymer has a refraction index lower than or equal to 1.54.

20.   A composition according to any one of the preceding claims, characterized in that it has a viscosity lower than or equal to 0.3 Pa.s.

21.   A transparent polymer substrate with a refraction index varying between 1.48 and 1.52, characterized in that it is obtained through polymerization of a composition according to any one of the preceding claims.

22.   An optical lens comprising a polymer substrate according to claim 21.

23.   An optical lens according to claim 22, characterized in that the lens is an ophthalmic lens.

24.   An optical lens according to claim 23, characterized in that the lens is a glass.